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**Natural Metalliferous Organic Soils: Probing the Distribution of Zn, Fe, Ca, Mn, and S in Soil Particles by Synchrotron-Based micro-XRF**

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Beamline: X26A

Synchrotron radiation induced  $\mu$ -X-ray fluorescence was used to probe the distribution of various elements in organic matter-rich soils. The soil particles were embedded in paraffin and sectioned to 20  $\mu\text{m}$  thickness. Synchrotron-based  $\mu$ -XRF analysis exposed the elemental micro-heterogeneity within soil aggregates and their associations. For example, the measurements indicated Zn and Ca to be concentrated in some small areas (“hot spots”) rather than homogeneously distributed although they were present throughout the aggregate. Hot spots were present both at the “exterior” as well as at the “interior” of soil aggregates. Elemental distributions and associations within soil aggregates are critical factors determining contaminant behavior (solid-solution partitioning) in soil environments and influence the biological availability of these elements.

### Guelph 3

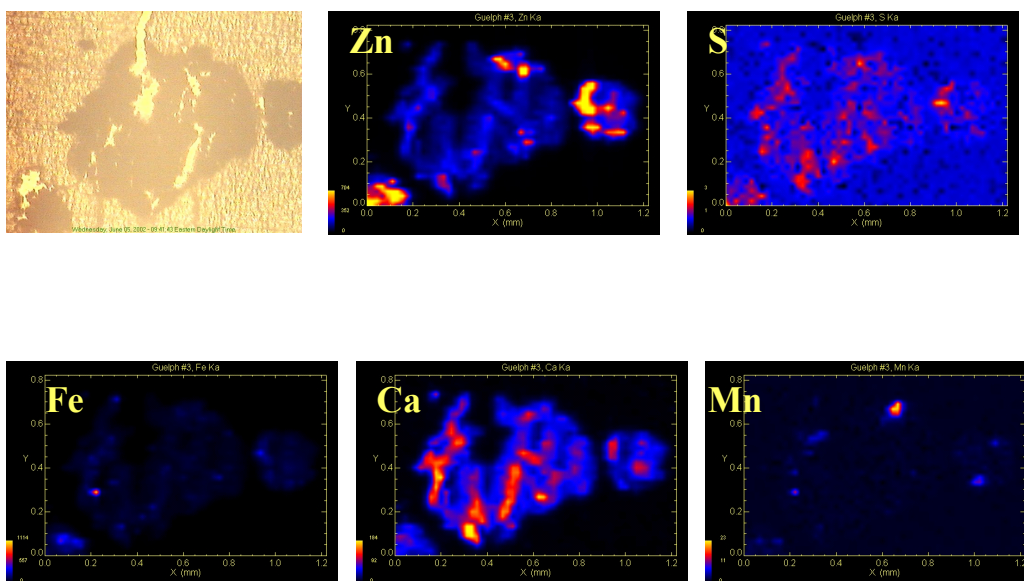


Figure 1. X-ray fluorescence analysis of a soil particle (20  $\mu\text{m}$  section)